# HEATING AND VENTILATION SYSTEM

## HEATING AND VENTILATION SYSTEM, ASSEMBLY

**CAUTION: Before beginning repairs on the electrical system:**

- **Obtain the anti-theft radio security code.**
- **Switch the ignition off.**
- **Disconnect the battery Ground (GND) strap.**
- **After reconnecting battery, re-code and check operation of anti-theft radio. Also check operation of clock and power windows according to service information and/or Owner's Manual.**

**NOTE: The following list refers to items in Fig. 1 .**

1. **Heating and ventilation controls**
   - With fresh air blower switch -E9- and switch for fresh air blower and recirculating air -E184-
   - Removing and installing, See **Heating and ventilation controls, removing and installing**
   - Assembly, See **Heating and ventilation controls, assembly**
   - Installing and adjusting cables, See **Heating and ventilation cables, installing and adjusting**
2. **Dust and pollen filter**
   - Removing and installing, See **Dust and pollen filter, removing and installing**
3. **Side window air outlet**
   - Removing, See **Air outlets, removing**
4. **Side air outlets**
   - Removing, See **Air outlets, removing**
5. **Center air outlet console**
   - Removing, See **Center air outlet console, removing**
6. **Instrument panel cross member**
   - Loosening and tightening, See **Fig. 3**
7. **Servo motor for fresh/recirculating air door-V154-**
   - Removing and installing, See **Servo motor for fresh/recirculating air door -V154-, removing and installing**
8. **Fresh air blower -V2-**
   - Removing, See **Fig. 2**
9. **Fresh air blower series resistance with fuse -N24-**

- Removing Fresh air blower -V2-, See **Fig. 2**

10. **Intermediate duct**
11. **Cables**
    - Installing and adjusting, See **Heating and ventilation cables, installing and adjusting**
12. **Rear footwell air outlet duct**
13. **Gasket**
14. **Connecting duct**
    - With front footwell air outlet
    - Removing, See **Connecting duct, removing**
15. **Heating and ventilation unit**
    - Removing:
        - Remove instrument panel

          See **INSTRUMENT PANEL, REMOVING AND INSTALLING** .

        - Carefully pinch off both coolant hoses to heater core and disconnect hoses.
        - Loosen instrument panel cross member, See **Fig. 3**
        - Remove unit
    - Disassembly and assembly, See **Heating and ventilation unit, assembly**
16. **Heater core**
    - Always use new coolant after replacement
    - Replacing, See **Heating and ventilation unit, assembly**
17. **Heater core/bulkhead seal**
    - Note installation position, See **Fig. 23**
18. **Defroster duct**
    - Replacing:
        - Remove instrument panel

          See **INSTRUMENT PANEL, REMOVING AND INSTALLING** .

        - Loosen instrument panel cross member, See **Fig. 3**
19. **Instrument panel**
    - Removing and installing

      See **INSTRUMENT PANEL, REMOVING AND INSTALLING** .

20. **Center air outlet duct**
21. **Defroster air outlet panel**
    - Removing, See **Defroster air outlet panel, removing**

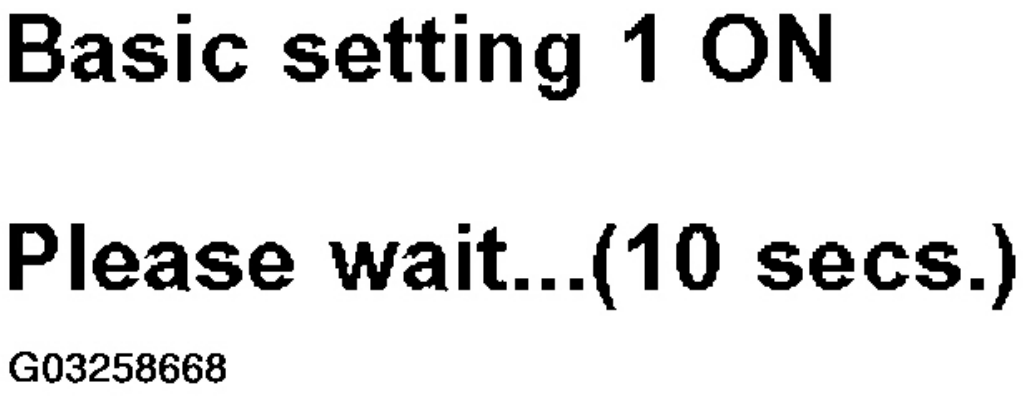


**Fig. 1: Identifying Components Location Of Heating And Ventilation System**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Fresh Air Blower**

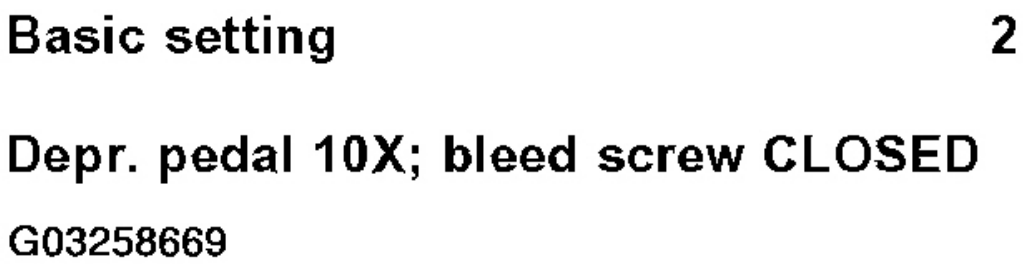


**Fig. 2: Exploded View Of Fresh Air Blower Assembly**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**NOTE: The following list refers to items in Fig. 2 .**

1. Heating and ventilation unit
2. Fresh air blower -V2-
3. Cover
4. Screws

5. Fresh air blower series resistance with fuse -N24-

**Fresh Air Blower Removing**

- Remove glove box.

  See **GLOVE BOX, REMOVING AND INSTALLING** .

- Remove screws -4- and remove cover -3-. See **Fig. 2** .
- Remove cover containing series resistor -5- and disconnect electrical connector.
- Disconnect electrical connector from fresh air blower -2-. See **Fig. 2** .
- Remove fresh air blower series resistor -5-. See **Fig. 2** .
- Pull fresh air blower out downwards.

**Instrument Panel Cross Member**

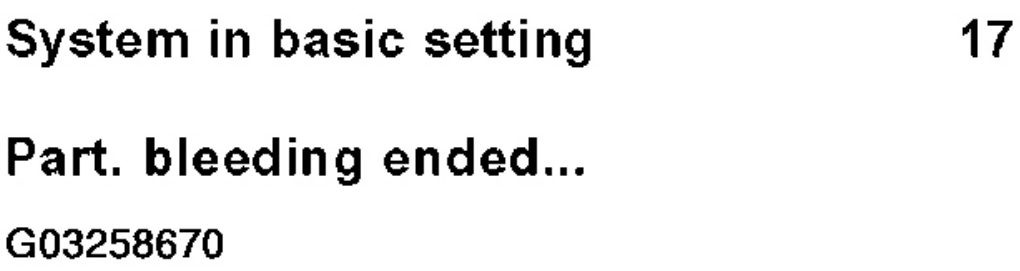


**Fig. 3: Loosening And Tightening Instrument Panel Cross Member**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**NOTE: The following list refers to items in Fig. 3 .**

- Remove securing bolts -arrows-.
  - Tightening torque 25 N.m (18 ft lb)

  To access or remove heating and ventilation unit, lift cross member in direction of -arrow A- and support.

**NOTE:**

- **To prevent damage to the steering column, work should be done with aid of another technician.**
- **If removed component(s) are not to be reinstalled immediately,**

**secure the cross member to the bulkhead.**

- **Any wiring harnesses released from their retainers must be secured again at the same point, using the same method of securing.**

**Connecting duct, removing**

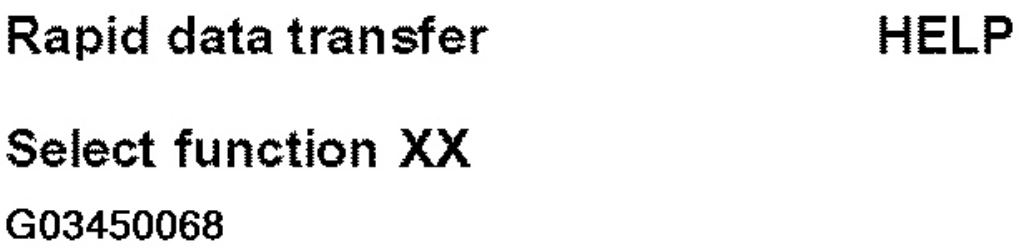


**Fig. 4: Connecting Duct Assembly**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**NOTE: The following list refers to items in Fig. 4 .**

1. Bolt
2. Connecting duct
3. Rear duct
4. Retainer
5. Cover
6. Bolt

First do the following:

- Remove glove box.

  See **GLOVE BOX, REMOVING AND INSTALLING** .

- Remove steering column trim.

  See **TRIM UNDER STEERING COLUMN, REMOVING** .

- Remove center air outlet. See **Air outlets, removing** .
- Remove center console.

See **STORAGE, COVERS AND TRIMS** .

**Removing Connecting duct**

**NOTE: The following list refers to items in Fig. 5 .**

- Remove retainer -4-.
- Remove cover -5-.
- Pull connecting piece out towards the driver's side footwell -arrow A-.

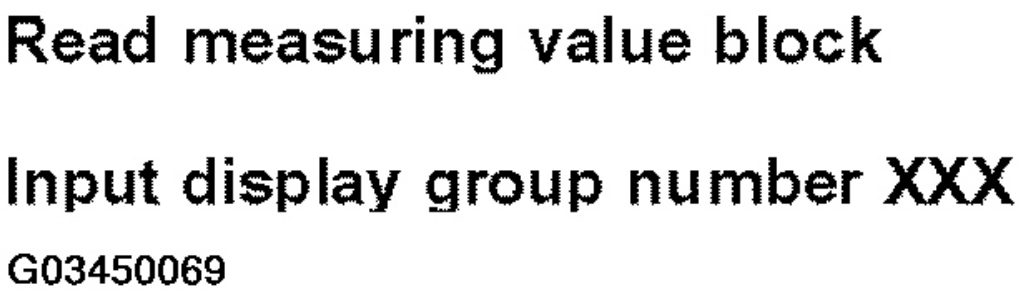


**Fig. 5: Pulling Connecting Piece Out Towards Driver's Side Footwell**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**DUST AND POLLEN FILTER, REMOVING AND INSTALLING**

The filter is located in the right rear of the instrument panel under a cover.

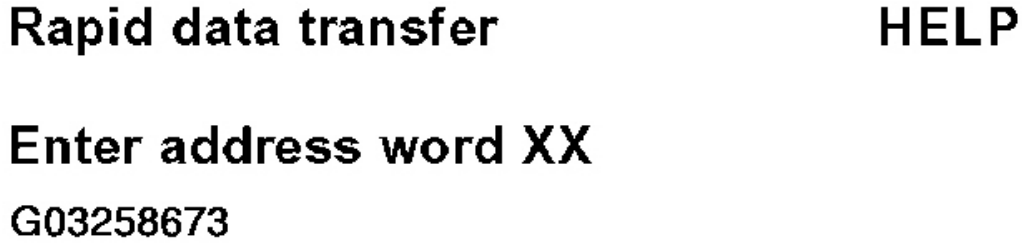


**Fig. 6: Identifying Components Of Dust And Pollen Filter**

**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**NOTE: The following list refers to items in Fig. 6 .**

Components of dust and pollen filter:

1. Frame
2. Filter element
3. Plastic nut, 2.5 N.m (20 in lb)
4. Filter housing with seal

**Removing**

- Push center cover -1- forward -arrow A- and lift up to remove.

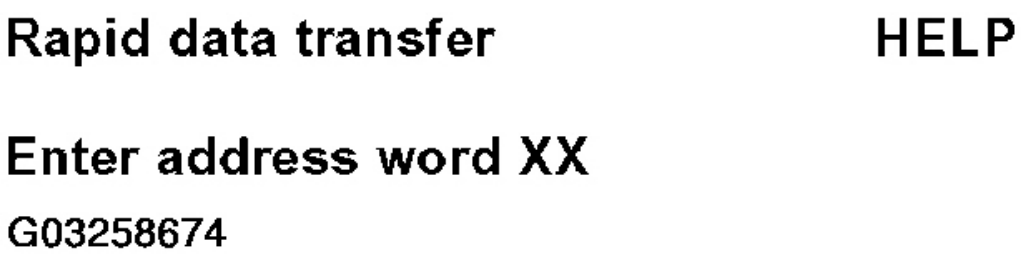


**Fig. 7: Pushing Center Cover Forward A- And Lifting Up To Remove**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

- Remove screws -arrows-. See **Fig. 8** .
- Lift right plenum panel cover -1- and remove from clips at front and rear edge. See **Fig. 8** .
- Pull cover -1- toward center of vehicle and out of retainer in A-pillar to remove.

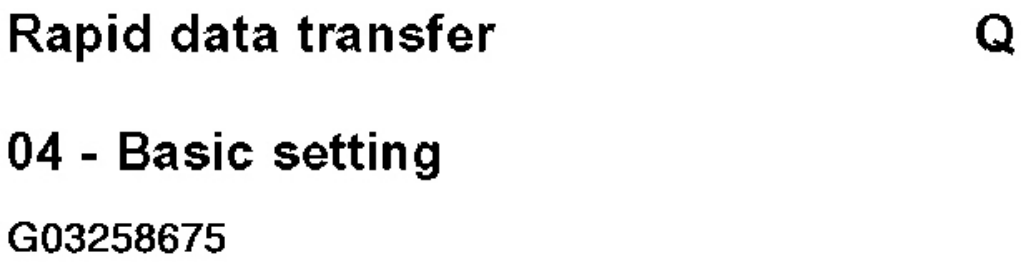


**Fig. 8: Lifting Right Plenum Panel Cover And Removing From Clips At Front And Rear Edge**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

- Remove screws -arrows- and remove right closeout panel -1-.

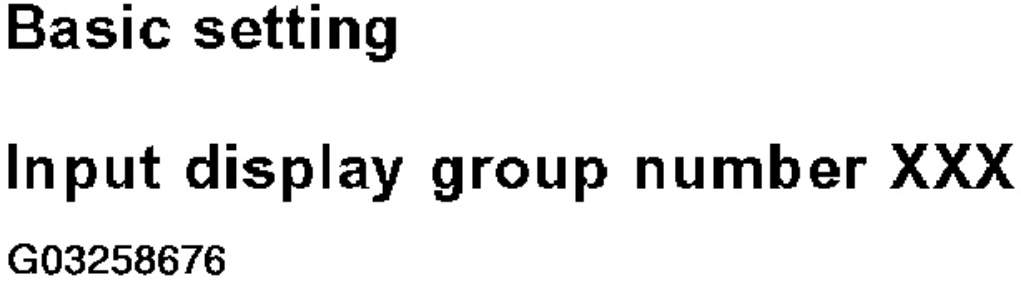


**Fig. 9: Removing Screws And Remove Right Closeout Panel**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

- Remove rubber grommet -1-.
- Press tabs of filter housing in direction of -arrow-.
- Remove filter element with frame in upward direction -arrow A-.

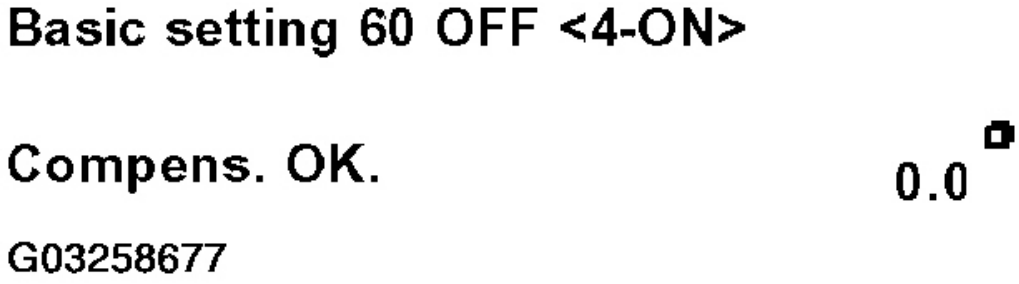


**Fig. 10: Removing Filter Element With Frame In Upward Direction**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Installing**

- Guide frame -1- into first slot on left and right sides of new filter element.
- Press frame with filter into housing -2- and engage retainers.

**AIR OUTLETS, REMOVING**

**NOTE: To prevent damage to air outlets, use needle nose pliers with suitable plastic or rubber protection on jaws.**

**Side window air outlets, removing**

- Carefully remove air outlet -1- with needle nose pliers.

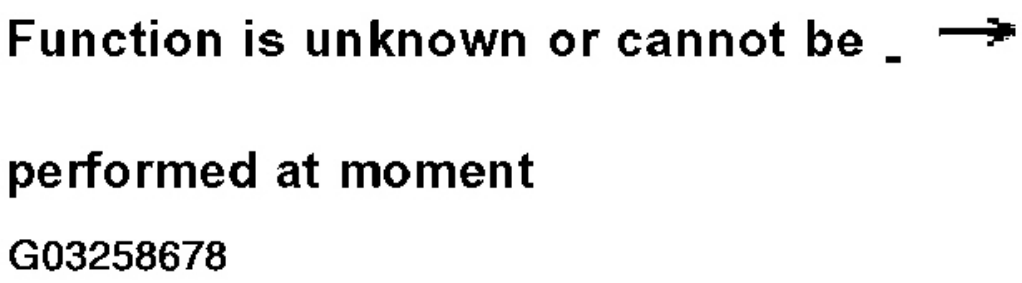


**Fig. 11: Removing Air Outlet With Needle Nose Pliers**

**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Side air outlets, removing**

- Carefully remove air outlet -1- with needle nose pliers as indicated.

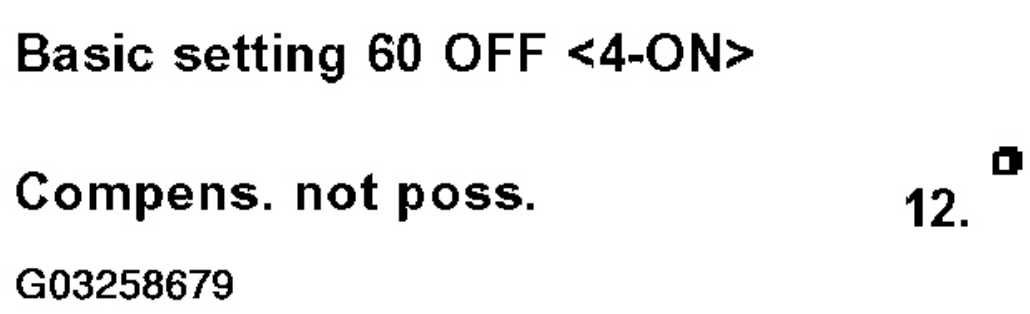


**Fig. 12: Removing Air Outlet With Needle Nose Pliers (Side Outlet)**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Center air outlet console, removing**

First do the following:

- Remove radio.

  See **RADIO, REMOVING AND INSTALLING** .

- Push center cover -1- forward -arrow A- and lift up to remove.

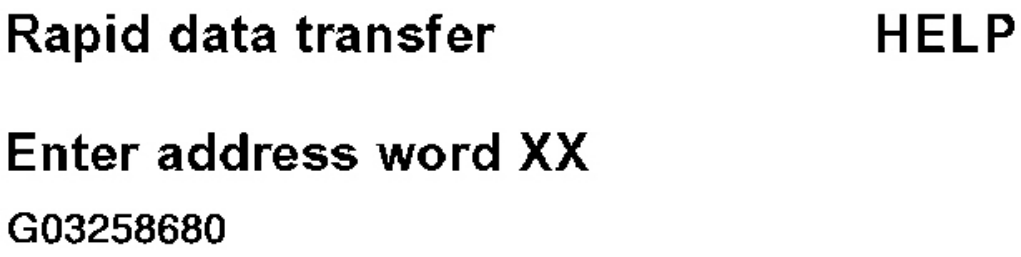

**Fig. 13: Pushing Center Cover Forward And Lifting Up To Remove**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

- Unclip covers -2-. See **Fig. 14** .
- Remove lower switch console cover -1- (remove screws).

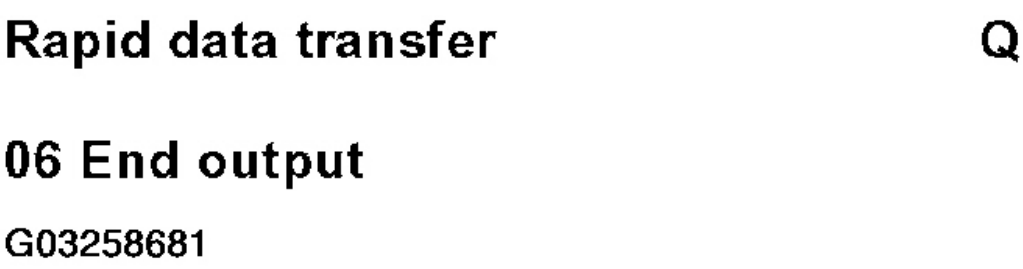


**Fig. 14: Removing Lower Switch Console Cover**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

- Remove screws -arrows-. See **Fig. 15** .
- Remove center air outlet console.

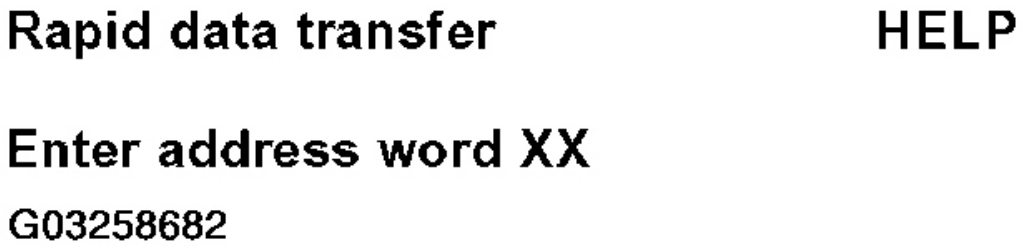


**Fig. 15: Removing Center Air Outlet Console**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**DEFROSTER AIR OUTLET PANEL, REMOVING**

First do the following:

- Remove radio

  See **RADIO, REMOVING AND INSTALLING** .

- Remove center air outlet console, See **Center air outlet console, removing** .
- Remove plenum panel covers -1- and -2-. See **Fig. 16** .

  See **INSTRUMENT PANEL, REMOVING AND INSTALLING** .

- Remove closeout panels -3- and -4-. See **Fig. 16** .
- Remove spreader rivets -6- and lift out panel -5- from bulkhead clips.

**NOTE: The following list refers to items in Fig. 16 .**

1. **Plenum panel cover**
   - Driver side
2. **Plenum panel cover**
   - Passenger side
3. **Closeout panel**
   - Driver side
4. **Closeout panel**
   - Passenger side
5. **Defroster air outlet panel**
6. **Spreader rivets**

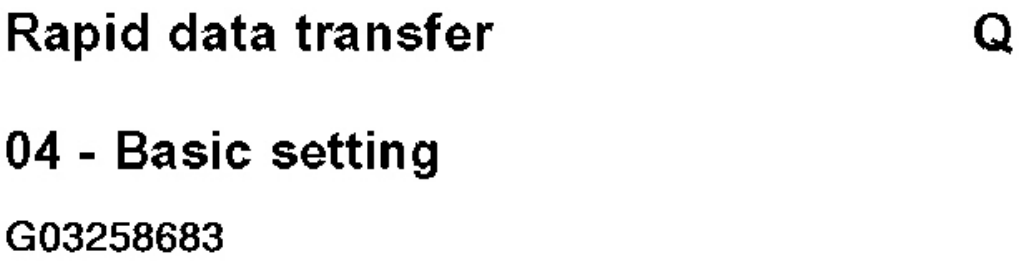


**Fig. 16: Removing Defroster Air Outlet Panel**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**HEATING AND VENTILATION CONTROLS, REMOVING AND INSTALLING**

**Removing**

- Remove center air outlet console. See **Air outlets, removing** .
- Remove mounting screws -arrows-.

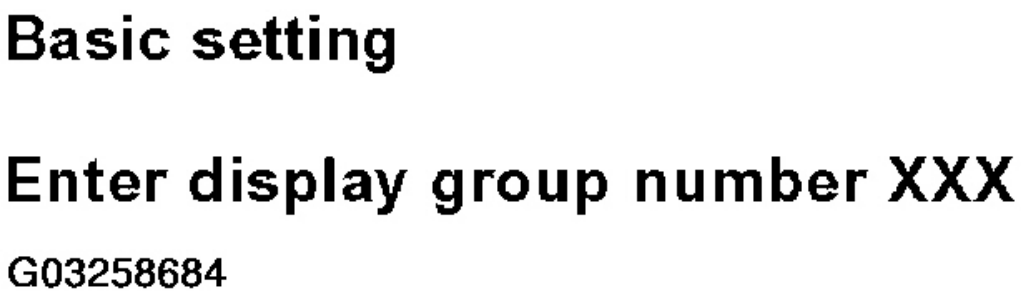


**Fig. 17: Removing Heating And Ventilation Controls Mounting Screws**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

- Lift out controls with cables from instrument panel in direction of -arrow A-.
- Detach cables from controls.
- Disconnect electrical connector.

With controls removed, check function of heating and ventilation cables as follows:

- Move cables in and out several times -arrow-.
- Replace damaged or stiff cables.

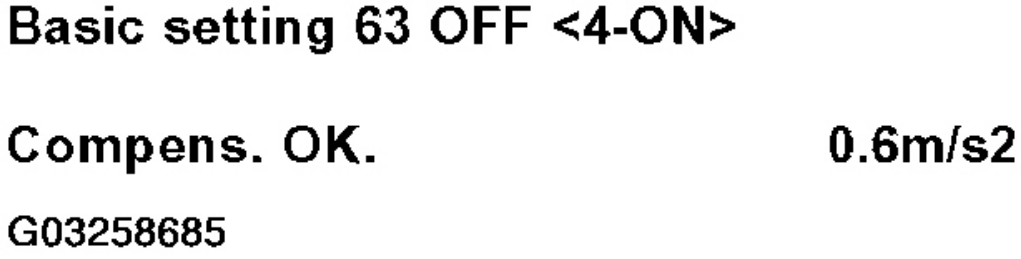

**Fig. 18: Checking Function Of Heating And Ventilation Cables**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Installing**

**NOTE:**

- **Cable sleeves are color coded.**
- **All flaps must audibly move onto stops when turning controls.**
- **Always check cables before installing. Replace tight or damaged cables.**

- Attach cable -1- to actuating arm -2- as indicated-arrow-.

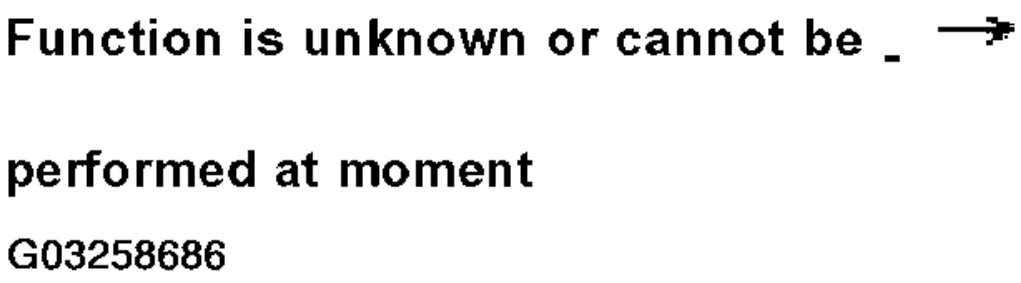


**Fig. 19: Attaching Cable To Actuating Arm**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

- Press cable for footwell/defrost, cable for temperature flap and cable for central flap -1- into retainer -2- until it engages.

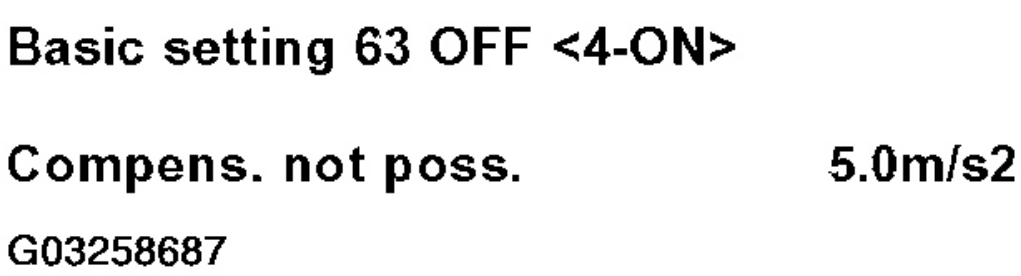


**Fig. 20: Pressing Cable For Footwell/Defrost, Cable For Temperature Flap And Cable For Central**

**Flap -1- Into Retainer**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Cable color codes**

- Footwell/defrost flap cable: green
- Central flap cable: yellow
- Temperature flap cable: beige
  - Check and adjust cables, See **Heating and ventilation cables, installing and adjusting** .
  - Connect electrical connector
  - Fit controls into instrument panel opening and install mounting screws.

**HEATING AND VENTILATION UNIT, ASSEMBLY**

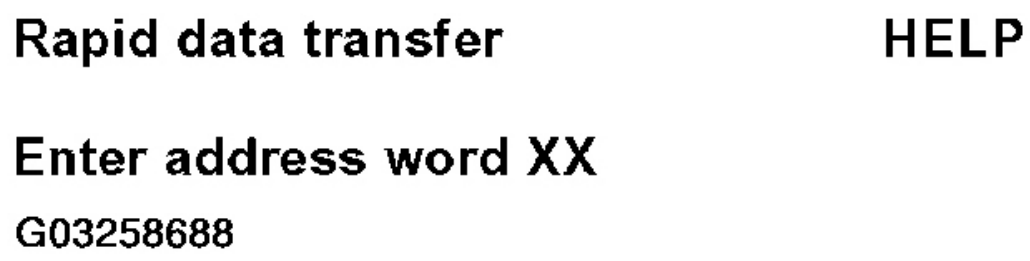


**Fig. 21: Identifying Components Of Heating And Ventilation Unit**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**NOTE: The following list refers to items in Fig. 21 .**

1. **Heater core**
   - Always use new coolant after replacement
   - Removing:
     - Remove instrument panel.

       See **INSTRUMENT PANEL, REMOVING AND INSTALLING** .

     - Loosen Instrument panel cross member. See **Fig. 3** .
     - Carefully pinch off both coolant hoses to heater core and disconnect hoses.

**CAUTION: The cooling system is pressurized when the engine is warm.**

**Wear gloves and other protection and carefully release system pressure if necessary, before performing repairs.**

- Partially remove heating and ventilation unit.
- Press retainer clips and remove heater core.

2. **Self-tapping screw**
   - Use if retainer clips break
3. **Air distribution housing**
4. **Servo motor for fresh/recirculating air door-V154-**
   - Removing and installing, See **Servo motor for fresh/recirculating air door -V154-, removing and installing**
5. **Self-tapping screw**
6. **Fresh air blower - V2-**
   - Removing see **Fig. 2**
7. **Cover**
8. **Self-tapping screw**
9. **Series resistor - N24-**
   - Removing, see **Fig. 2** .
10. **Self-tapping screw**
11. **Central flap lever**
    - Installing and adjusting, See **Fig. 22**
12. **Temperature flap lever**
13. **Base plate**
14. **Heater core bulkhead seal**
    - Note installation position
    - Installing, See **Fig. 23**

The central flap pinion has an adjustment mark.

- Install the lever so that the notches on the lever and the pinion align -arrows-.

**Fig. 22: Installing Central Flap Lever**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

The seal between the heater core and the bulkhead has a positioning mark.

- Install the seal -1- so that the notches on the seal and the base plate -2- align -3-.

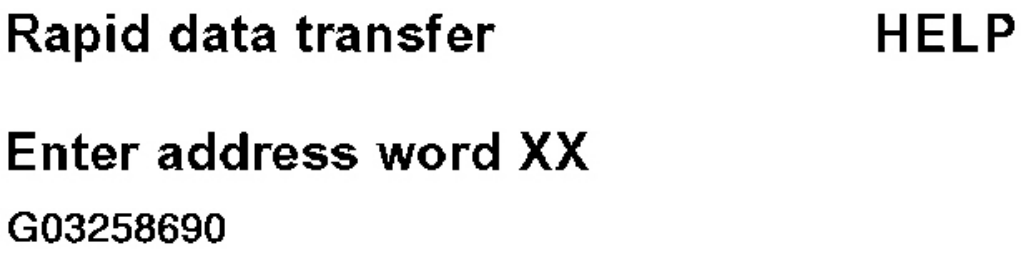


**Fig. 23: Identifying Installation Position Heater Core Bulkhead Seal**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Servo motor for fresh/recirculating air door -V154-, removing and installing**

**Removing**

- Remove glove box.

  See **GLOVE BOX, REMOVING AND INSTALLING** .

- Disconnect electrical connector -1-. See **Fig. 24** .

- Remove screw -3-.
- Swing motor -2- downwards.
- Disconnect motor -2- from fresh air/recirculating air door lever.

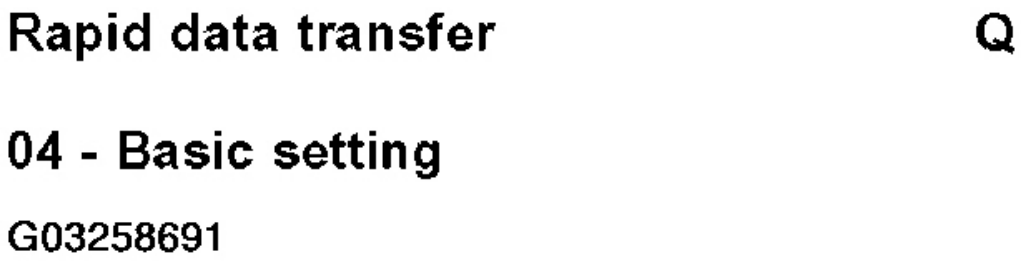


**Fig. 24: Disconnecting Motor From Fresh Air/Recirculating Air Door Lever**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Installing**

Replacement motors are supplied with operating levers in the "recirculating air" position. To ease installation, first do the following:

- Attach electrical connector -1- to flap motor -2-. See **Fig. 25** .
- Switch on ignition.
- Operate button for fresh air/recirculating air and observe lever position.

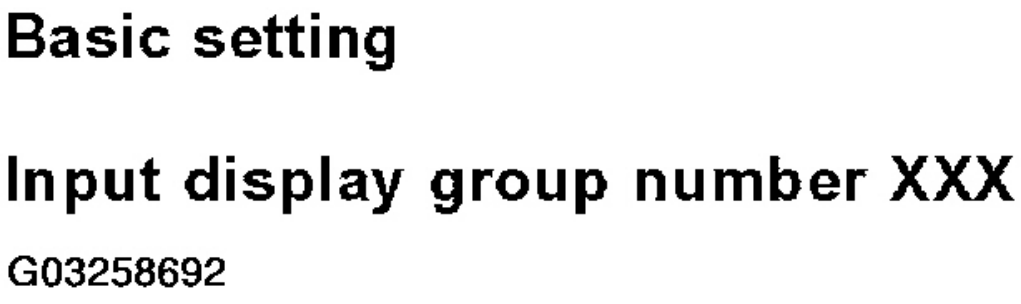


**Fig. 25: Attaching Electrical Connector To Flap Motor**

**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

- When the center position is reached, quickly disconnect the electrical connector.
- Insert motor onto the fresh air/recirculating air shaft -1-. See **Fig. 2**

**NOTE: If it is difficult to align and fit the motor to shaft -1-, remove fresh air blower -V2- and position flap/shaft as required. See Fig. 2 .**

- Turn motor in direction of -arrow A-.
- Install mounting screw.
- Reconnect electrical connector.

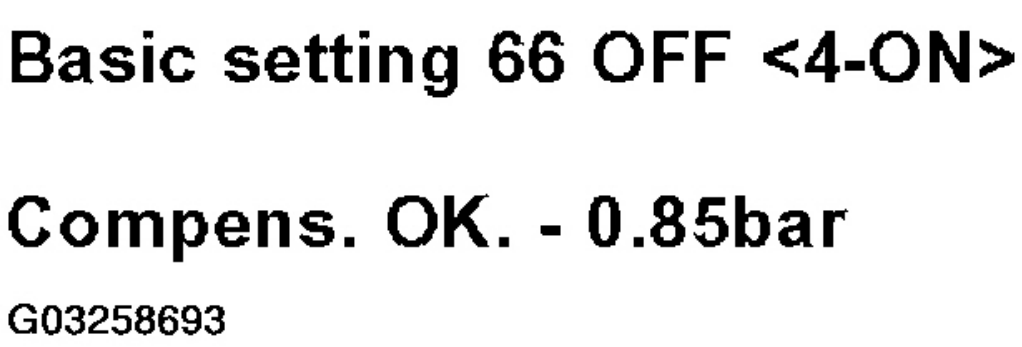


**Fig. 26: Inserting Motor Onto Fresh Air/Recirculating Air Shaft**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

## HEATING AND VENTILATION CONTROLS, ASSEMBLY

**NOTE: The following list refers to items in Fig. 27 .**

1. **Heating and ventilation controls**
   - With fresh air blower switch -E9-
   - With switch for fresh air blower and recirculated air -E184-
   - Removing and installing, See **Heating and ventilation controls, removing and installing** .
2. **Illumination filter**
3. **Trim panel**
4. **Fresh air control lever light -L16-**
   - 12V, 1.2W
5. **Rotary control**

- For blower speed
- To remove: Use pliers with suitable plastic or rubber protection on jaws

6. **Rotary control**
   - For air distribution
   - To remove: Use pliers with suitable plastic or rubber protection on jaws
7. **Rotary control**
   - For interior temperature
   - To remove: Use pliers with suitable plastic or rubber protection on jaws

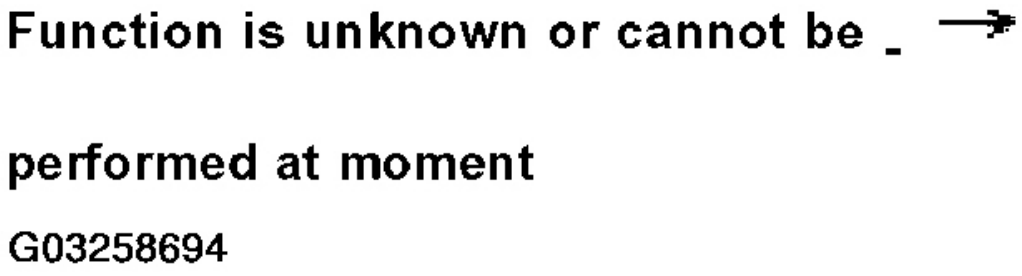


**Fig. 27: Identifying Components Of Heating And Ventilation Controls Assembly**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**HEATING AND VENTILATION CABLES, INSTALLING AND ADJUSTING**

**NOTE:**

- **Cable sleeve ends are color coded.**
- **Check cables before installing. Replace binding or damaged cables.**
- **Attach cables to removed controls first and then attach to levers at heating and ventilation unit.**
- **All air flaps must audibly move onto end stops when turning controls.**

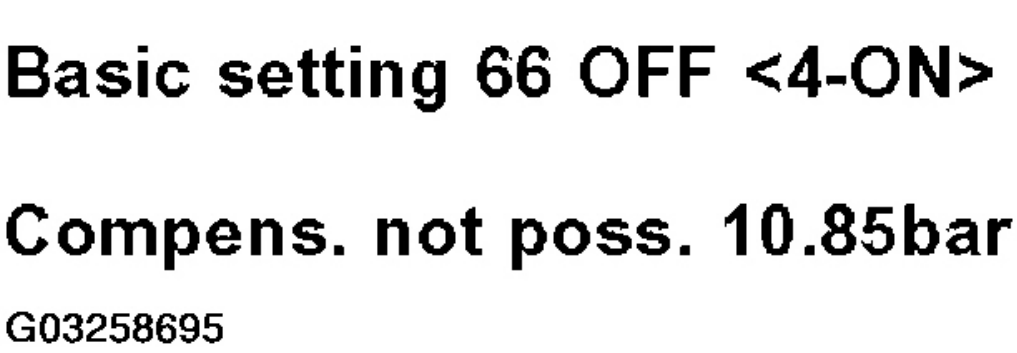


**Fig. 28: Installing Heating And Ventilation Cables**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**NOTE: The following list refers to items in Fig. 28 .**

1. **Central flap cable**
   - From air distribution rotary control to central flap
   - Cable sleeve marking: Yellow
   - Installing and adjusting, See **INSTALLING & Adjusting Central Flap Cable**
2. **Footwell/defrost flap cable**
   - From air distribution rotary control to footwell/defrost flap
   - Cable sleeve marking: Green
   - Removing:
     - Remove heating and ventilation controls, See **Heating and ventilation controls, removing and installing**
     - Unclip cable from controls
     - Remove steering column trim.

       See **TRIM UNDER STEERING COLUMN, REMOVING** .

     - Unclip cable at heating and ventilation unit.
   - Installing and adjusting, See **Installing & Adjusting Footwell/Defrost Flap Cable**
3. **Heating and ventilation controls**
   - Removing and installing, See **Heating and ventilation controls, removing and installing**
4. **Temperature flap cable**
   - From temperature rotary control to temperature flap
   - Cable sleeve marking: Beige

- Installing and adjusting, See **Adjusting Temperature Flap Cable**

**Adjusting Temperature Flap Cable**

Cable sleeve marking: Beige

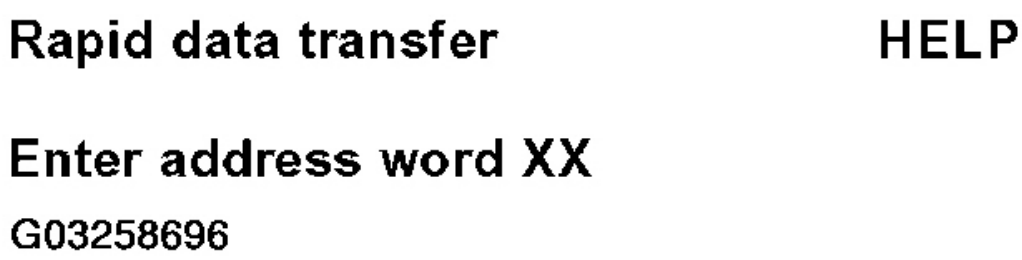


**Fig. 29: Installing Temperature Flap Cable**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Prerequisites:**

- Heating and ventilation controls are installed.
- Connecting duct removed, See **Connecting duct, removing** .

- Turn temperature rotary control knob to left onto stop.
- Attach center wire of cable -1- to the temperature flap lever -2-. See **Fig. 29** .
- Push temperature flap lever -2- onto stop -arrow A- and secure outer cable -1- with clip -3-.
- Turn temperature rotary control knob to left and right onto stops.

  When turning the rotary control knob both end stops must be reached.

**Installing & Adjusting Footwell/Defrost Flap Cable**

Cable sleeve marking: Green

**Fig. 30: Installing & Adjusting Footwell/Defrost Flap Cable**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

**Prerequisite:**

- Heating and ventilation controls are installed.

- Turn air distribution rotary knob to left onto stop.
- Attach end of cable -1- to the temperature flap lever -3-, arrow -A-. See **Fig. 30** .
- Press footwell/defrost flap lever onto stop arrow -C- and attach outer cable -1- with clip -2-, arrow -B-.
- Turn air distribution rotary control knob to left and right onto stops.

  When turning the rotary control knob both end stops must be reached.

**Installing & Adjusting Central Flap Cable**

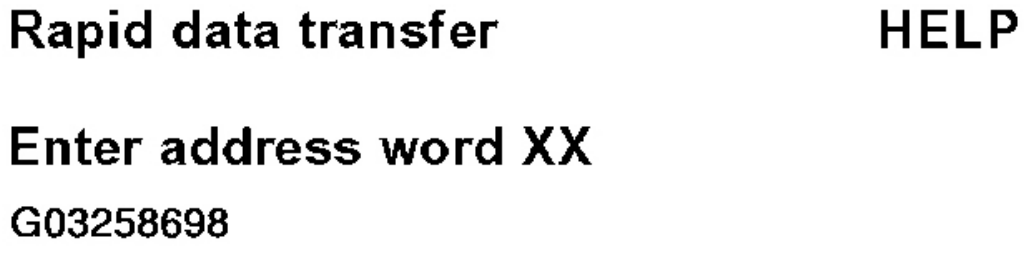


**Fig. 31: Installing & Adjusting Central Flap Cable**
**Courtesy of VOLKSWAGEN OF AMERICA, INC.**

Cable sleeve marking: Yellow

**Prerequisites:**

- Central flap lever correctly adjusted see , **Fig. 22** .
- Heating and ventilation controls are installed.
- Connecting duct removed, See **Connecting duct, removing** .

- Turn air distribution rotary control knob to left onto stop.
- Attach center wire of cable -2- to the central flap lever -1-. See **Fig. 31** .
- Press footwell/defrost flap lever onto stop arrow -A- and attach outer cable -2- with clip -3-.
- Turn air distribution rotary control knob to left and right onto stops.

  When turning the rotary control knob both end stops must be reached.